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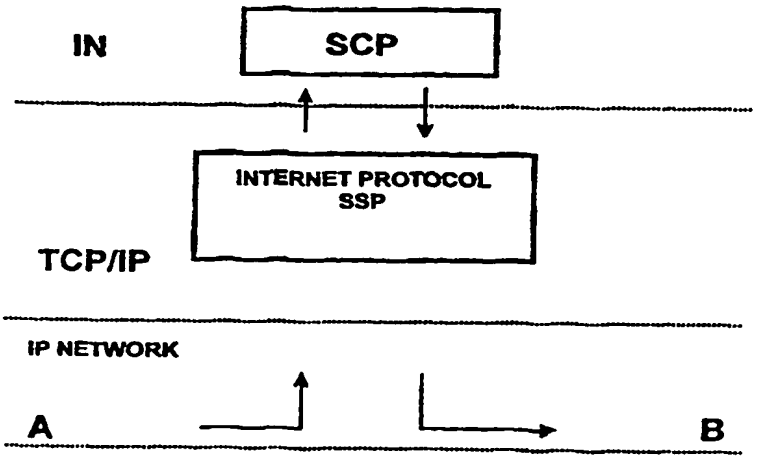
(54) Title: A TELECOMMUNICATION NETWORK INCLUDING AN IP-NETWORK AND AN INTELLIGENT NETWORK



(57) Abstract

Intelligent networks have been developed with the primary object of facilitating the provision of complex telecommunications services. In contrast to this, networks based on TCP/IP are intended to handle substantial quantities of data and are, therefore, ideal for broadband communications. Thus, there is much to be gained from a telecommunications system and network which can effectively integrate an IN with an IP network. An integrated IP and IN network can use the IN network to handle service management and customer data for services provided over the IP network. This enables the IN development environment to be used in other environments. Thus, the service environment can be the same for a given service, regardless of where it is realised. The present invention provides a telecommunications network which includes an IP network and an intelligent network. Services provided on the IP network are controlled by the intelligent network via an IP-Service Switching Point.

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A TELECOMMUNICATION NETWORK INCLUDING AN IP-NETWORK AND AN INTELLIGENT NETWORK

The present invention relates to an integrated IP and IN network, an Internet Protocol Service Switching Point and methods of integrating IP services with intelligent networks.

Intelligent networks have been developed with the primary objet of facilitating the provision of complex telecommunications services. In contrast to this, networks based on TCP/IP are intended to handle substantial quantities of data and are, therefore, ideal for broadband communications.

One example of a proprietary IN architecture is the Hewlett Packard OpenCall Intelligent network architecture.

The principle advantages of the IN standard are:

- the very effective signalling arrangements between service nodes; and
- the ability to rapidly develop complex telecommunications services.

Broadband technology, using TCP/IP, has powerful traffic carrying capacity and datalink provision to users and multiple users.

Thus, there is much to be gained from a telecommunications system and network which can effectively integrate an IN with an IP network.

It is an object of the present invention to provide such an integration.

An integrated IP and IN network can use the IN network to handle service

management and customer data for services provided over the IP network. This enables the IN development environment to be used in other environments. Thus, the service environment can be the same for a given service, regardless of where it is realised.

According to a first aspect of the present invention, there is provided a telecommunications network, including an IP network and an intelligent network, characterised in that control of services on said IP network is provided by the intelligent network via an IP-Service Switching Point.

Preferably, a traffic stream between a first and second point in said IP network is continuously routed via said IP-Service Switching point.

Said IP-Service Switching Point may be adapted to detect triggers in said traffic stream indicating that a packet contains a service command.

Said IP-Service Switching Point may include means for extracting service commands from said traffic stream on detection of a trigger, creating corresponding service messages and forwarding them towards said intelligent network.

Said intelligent network may include a Service Control Point adapted to receive service messages from said IP-Switching Point, execute commands contained therein and return control commands to said IP-Service Switching Point for control of said IP network.

Said commands may relate to tariff rates, call pricing, customer data, or call set-up data.

Said commands may be generated by means of a telephone keypad.

Said IP-service Switching Point may be adapted to operate as a transparent

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routing switch.

Said IP-Service Switching Point may be adapted to have the same functionality as an Intelligent Network Service Switching Point.

Said telecommunications network may be adapted to provide an IP-phone service.

According to a second aspect of the present invention, there is provided a method of operating an intelligent network, as set forth above.

Said IP-Service Switching Point may detect triggers in said traffic stream indicating that a packet contains a service command.

Said IP-Service Switching Point may extract service commands from said traffic stream, create corresponding service messages and forward said service messages towards said intelligent network.

Said service messages may be forwarded to a Service Control Point located in said Intelligent Network, said Service Control Point may execute commands contained in said service messages and return control commands to said IP-Service Switching Point, for control of said IP network.

According to a third aspect of the present invention, there is provided a telecommunications system, characterised in that it includes a telecommunications network as set forth above.

According to a fourth aspect of the present invention, there is provided an IP Service Switching Point, characterised in that it is adapted to operate with a telecommunications network as set forth above.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 illustrates the operation of an Internet Protocol Service Switching Point, according to the present invention, as a transparent switch.

Figure 2 illustrates the use of an Internet Protocol Service Switching Point, according to the present invention, for transmitting service commands between an IP-network and an intelligent network Service Control Point.

To assist in understanding the present specification, a glossary of the terms used in the specifications is set out below:

HP SCP:	Hewlett Packard OpenCall SCP
IN:	Intelligent Network
IP:	Internet Protocol
SCP:	Service Control Point
SDP:	Service Data Point
SSP:	Service Switching Point
TCP:	Transport Control Protocol

Cooperative interworking between an IN and an IP network can be achieved by the use of an "Internet Protocol SSP", or IP-SSP. An IP-SSP provides the following functions:

(1) transparent switching through which IP service traffic passes all the time;

(2) functions corresponding to an SSP in an ordinary telephone network, i.e. it has full SSP functionality;

(3) transmission of service commands between an IP-network and an IN architecture.

An IP based service, for example IP-phone, can thus, by virtue of integration with an IP-SSP obtain access to all the advantages of the IN environment for data handling. Thus, calls from an IP-phone can be routed through an IP-SSP. This can generate "triggers" and can communicate with the IN architecture.

Function (1) above, is illustrated in schematic form in Figure 1, in which it can be seen that service traffic, at all times, goes through the Internet Protocol SSP. Thus, if an IP-phone at A is in communication with B, traffic from A passes to B via the Internet Protocol SSP, at all times. It will be noted that the traffic is in TCP/IP format, and that the Internet Protocol SSP is controlled by a SCP in the IN.

The IP-SSP functions as a transparent routing IP switch and all traffic passes via this switch.

The IP-SSP monitors the traffic and identifies packets containing service commands. The IP-SSP, when it detects a service command in a packet, creates appropriate service messages which are transmitted to the IN-architecture. The IP-SSP, in the IN direction, is connected to, for example a SCP, such as an HP SCP with TCP/IP communication, or an SDP with stored service logic, or any other element. After the service messages are executed via the IN, the IP-SSP controls new call set-ups, connection paths etc. - i.e. the IP-SSP has identical functionality to an SSP.

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The functionality required for the transfer of service commands for setting up a new connection path is illustrated schematically in Figure 2.

User generated packets intended for service control are generated at A by means of keypads, or the like. The Internet Protocol SSP monitors the traffic passing through it and identifies triggers for the service commands transmitted from A. These service commands are transferred to the IN for execution. The service commands are received by, for example, a SCP in the IN, which causes the IN to execute the commands originating from the Internet Protocol SSP. These commands may relate to such things as adjustments to tariff rates and pricing, or changes to customer data, or production of new data required for a new call set-up. The new commands generated by the IN are returned to the IP network via the Internet Protocol SSP. New destinations and further set-ups etc. are managed by the IP-SSP.

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CLAIMS

1. A telecommunications network, including an IP network and an intelligent network, characterised in that control of services on said IP network is provided by the intelligent network via an IP-Service Switching Point.

2. A telecommunications network, as claimed in claim 1, characterised in that a traffic stream between a first and second point in said IP network is continuously routed via said IP-Service Switching point.

3. A telecommunications network, as claimed in claim 2, characterised in that said IP-Service Switching Point is adapted to detect triggers in said traffic stream indicating that a packet contains a service command.

4. A telecommunications network, as claimed in claim 3, characterised in that said IP-Service Switching Point includes means for extracting service commands from said traffic stream on detection of a trigger, creating corresponding service messages and forwarding them towards said intelligent network.

5. A telecommunications network, as claimed in claim 4, characterised in that said intelligent network includes a Service Control Point adapted to receive service messages from said IP-Switching Point, execute commands contained therein and return control commands to said IP-Service Switching Point for control of said IP network.

6. A telecommunications network, as claimed in claim 5, characterised in that said commands relate to tariff rates, call pricing, customer data, or call set-up data.

7. A telecommunications system as claimed in either claim 5, or claim 6, characterised in that said commands are generated by means of a telephone keypad.

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8. A telecommunications network, as claimed in any of claims 5 to 7, characterised in that said IP-service Switching Point is adapted to operate as a transparent routing switch.

9. A telecommunications network, as claimed in any previous claim, characterised in that said IP-Service Switching Point is adapted to have the same functionality as an Intelligent Network Service Switching Point.

10. A telecommunications network, as claimed in any previous claim, characterised in that it is adapted to provide an IP-phone service.

11. A method of operating an intelligent network, as claimed in claim 1, characterised by continuously routing traffic from a first network point to a second network point, in said IP network, via said IP-Switching Point.

12. A method, as claimed in claim 11, characterised by said IP-Service Switching Point detecting triggers in said traffic stream indicating that a packet contains a service command.

13. A method, as claimed in claim 12, characterised by said IP-Service Switching Point extracting service commands from said traffic stream, creating corresponding service messages and forwarding said service messages towards said intelligent network.

14. A method, as claimed in claim 13, characterised by forwarding said service messages to a Service Control Point located in said Intelligent Network, said Service Control Point executing commands contained in said service messages and returning control commands to said IP-Service Switching Point, for control of said IP network.

15. A telecommunications system, characterised in that it includes a telecommunications network as claimed in any of claims 1 to 10.

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16. An IP Service Switching Point, characterised in that it is adapted to operate with a telecommunications network as claimed in any of claims 1 to 10.

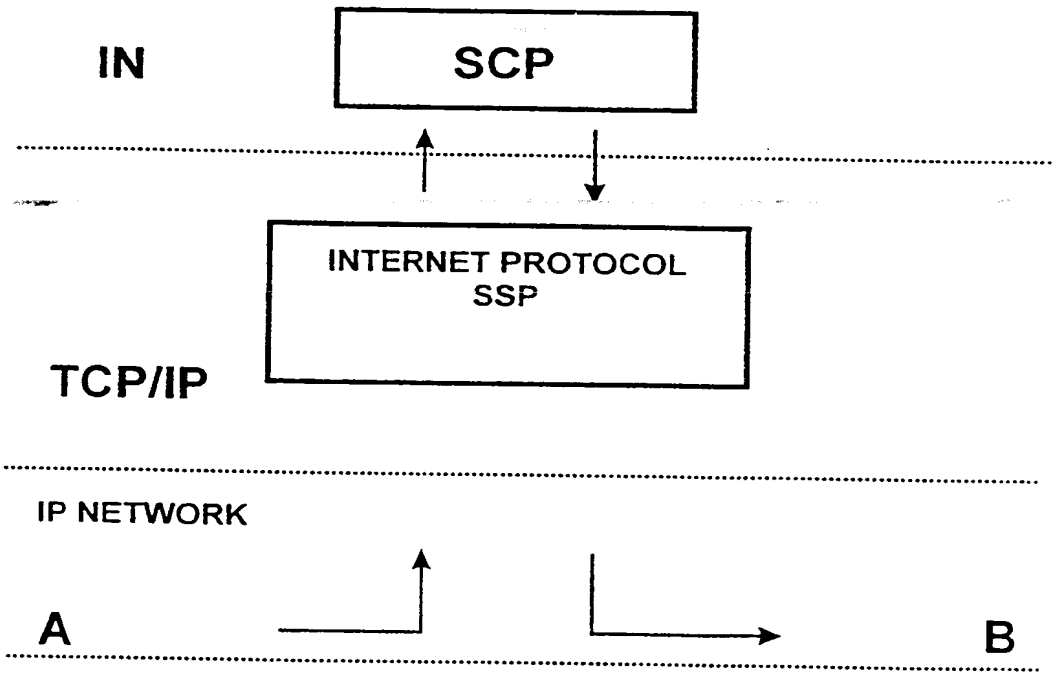

Figure 1

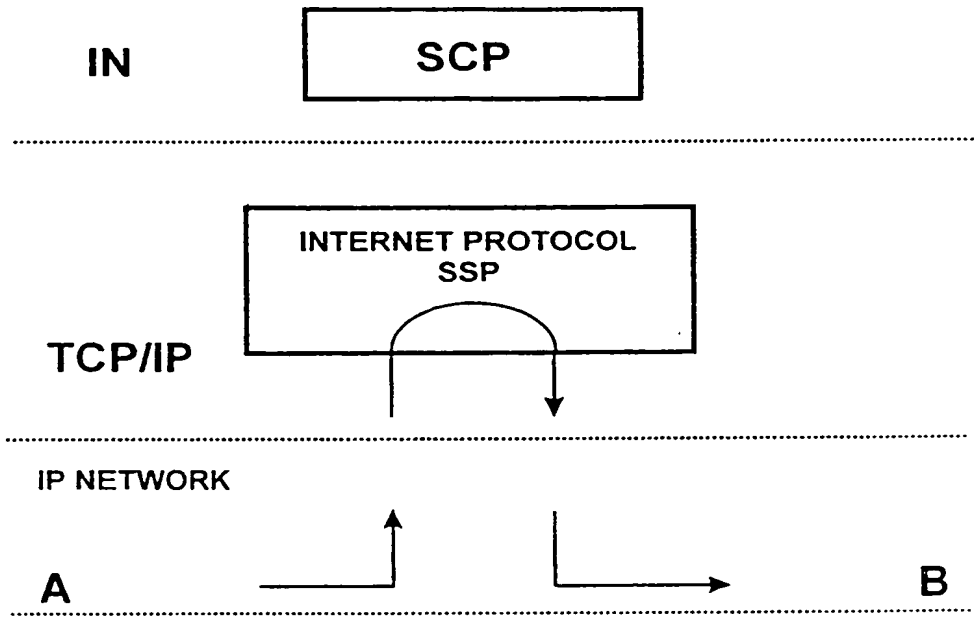

Figure 2

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 98/00200

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04L 12/66, H04L 29/06, H04Q 3/00
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04L, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9638018 A1 (TELEFONAKTIEBOLAGET LM ERICSSON), 28 November 1996 (28.11.96), page 4, line 26 - page 5, line 35; page 6, line 27 - page 7, line 6, figure 1	1-5,11-16
A	--	6-10
A	ITU-T Recommendation Q.1290 (10/95)	1-5,11-16
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☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9638018 A1	28/11/96	AU 5916696 A	11/12/96
		EP 0829181 A	18/03/98
		FI 952557 D	00/00/00
		NO 975343 A	21/01/98
		FI 961690 A	25/11/96

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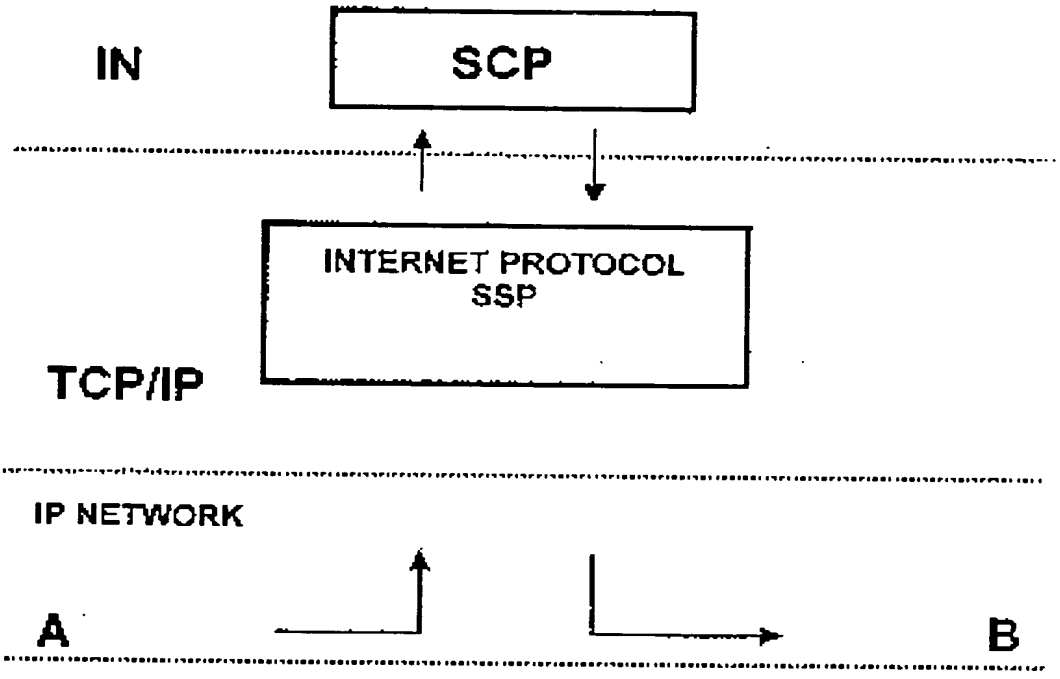

Figure 1

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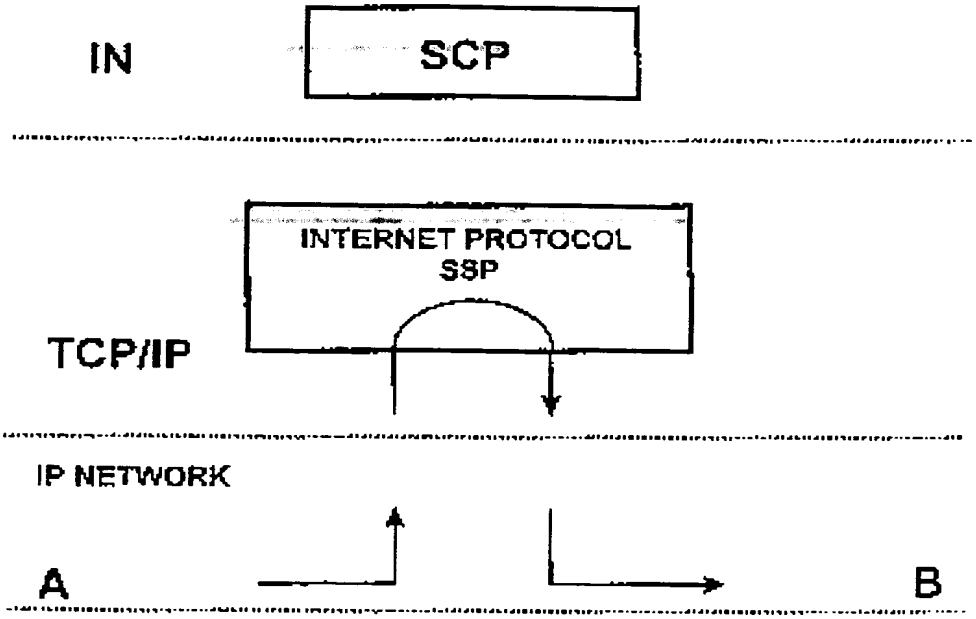

Figure 2